SEW EURODRIVE

Latest News!

MOVIDRIVE® MDX60B/61B

Edition

11/2003

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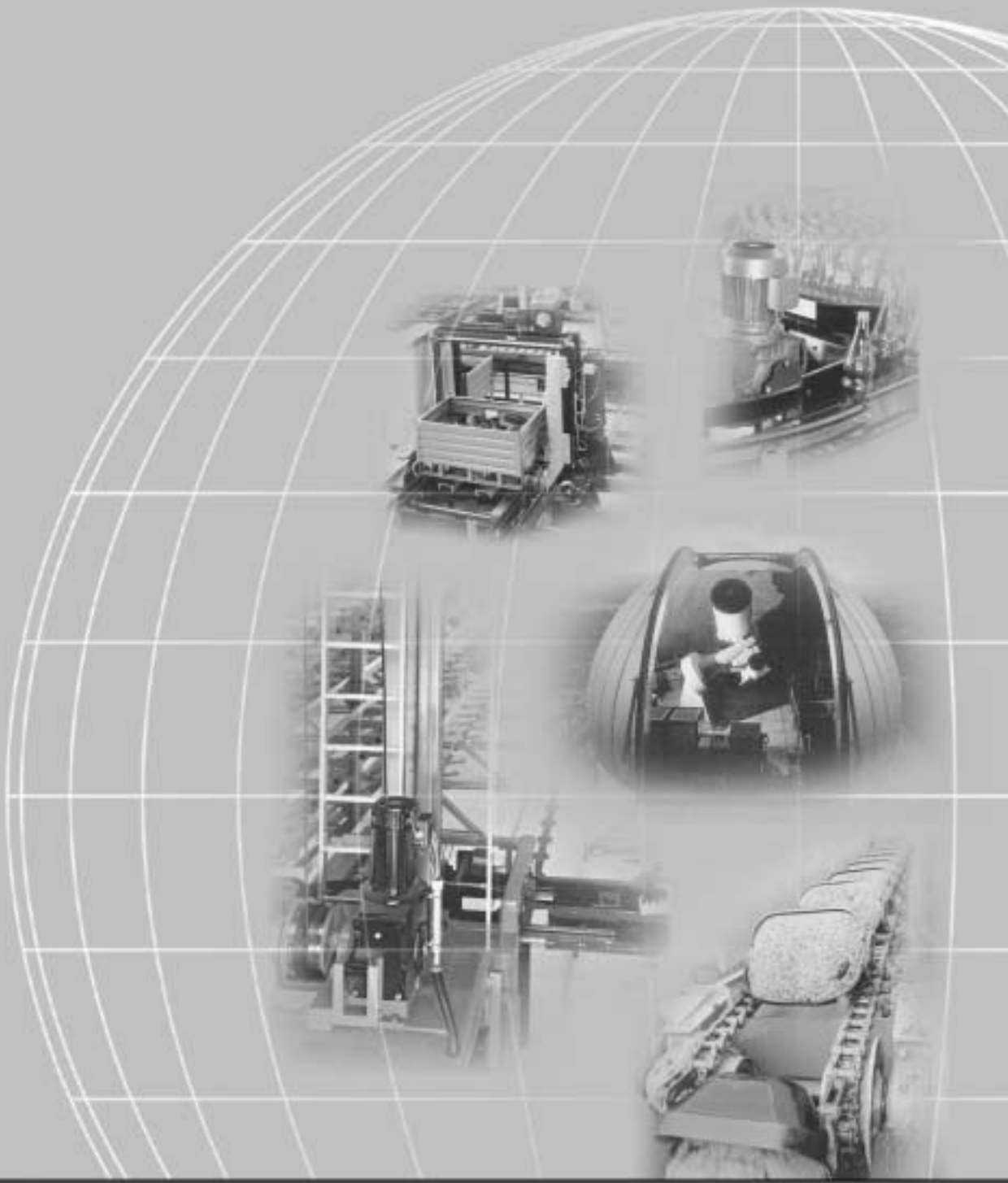

SEW-EURODRIVE

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1 The Concept

MOVIDRIVE® is the application specific frequency inverter from SEW-EURODRIVE. It is operated in large quantities in plant engineering because the unit is suitable for almost all applications, it can be equipped with options and it is very efficient. Several hundred thousand units have been shipped at this point. For SEW-EURODRIVE and its customers, the MOVIDRIVE® concept is a concept with a future that will be continued with the enhancement of MOVIDRIVE® B.

1.1 The situation with MOVIDRIVE® B

MOVIDRIVE® B is a compatible unit with additional functions that will replace the current MOVIDRIVE®. That goal will be accomplished with only one basic unit that will cover all existing versions via optional components. Additional functions expand the range of possible applications and secure the future success of MOVIDRIVE® units.

Power ratings from 0.55 kW to 1.5 kW will become a reality with the introduction of size 0 with the same range of functions in a compact and affordable package. This new size is available as a unit with options (MDX61B) or for particularly space-saving installations as a unit without option slots (MDX60B).

2 The Product

MOVIDRIVE® B is suitable for operation of asynchronous motors and synchronous motors. The unit can be expanded via option cards for the connection of encoders and fieldbuses.

2.1 Overview of properties

- **Supply voltages and power ratings**
  - 3x200 - 240 V / 1.5 - 30 kW
  - 3x380 - 500 V / 0.55 - 132 kW

- **Output current (continuous / maximum)**
  - 2/4 A - 250/375 A

- **Motor types**
  - Asynchronous motor without encoder
  - Asynchronous motor with encoder
  - Synchronous motor with resolver or Hiperface
  - Synchronous linear motors as special design

- **Number of different power ratings**
  - 36 power ratings in nine sizes

- **Overload capacity**
  - 125 % permanent overload
  - 150 % overload for 60 s
  - 200 % short-term overload up to 1.5 kW

- **Temperature range**
  - 0 - 60 °C operation
  - –25 - 70 °C storage

- **Certificates**
  - UL, cUL, C-Tick

- **Line filter**
  - Integrated up to 11 kW for EMC A
  - Optional as external filter starting at 15 kW or for EMC B

- **Enclosure**
  - IP 20 to 30 kW
  - IP10 as of 37 kW

- **Bus connection**
  - RS485, CAN, CANopen (in preparation), Profibus DPV1, Interbus, Interbus fiber optic cable, DeviceNet, CAN/CANopen metallically separated (in preparation)

- **Encoder connection**
  - Sin/Cos, TTL, Hiperface, Resolver, SSI

- **Number of inputs and outputs**
  - Basic unit: 8I/5O binary / 1I/0O analog
  - DIO11B option: 8I/8O binary / 1I/2O analog
  - DIP11B option: 8I/8O binary / 0I/0O analog

- **Integrated positioning and sequence control system**
  - IPOS®plus standard in basic unit
  - Velocity increased to factor 10
  - Memory increased to factor 4
  - 3rd sequence task added
  - Application modules activated in application version

2.2 The range of units

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Figure 1: MOVIDRIVE ®B series

MOVIDRIVE® MDX60B/61B consists of the following components:

Basic units

- MOVIDRIVE® **B in standard design MDX61B ... -00**
  - Inverter for operation of asynchronous motors and synchronous motors
  - Option slots available
  - Encoder input on encoder option card
  - IPOS® plus in basic unit
  - Power ratings from 0.55 kW to 132 kW at 3x380 - 500 V
  - Power ratings from 1.5 kW to 30 kW at 3x200 -240 V

- MOVIDRIVE® **B in application version MDX61B ... -0T**
  - Same as MDX61B ... -00 in standard version
  - Additional activation of software application modules and technology functions (internal synchronous operation, electronic cam, ...)

- MOVIDRIVE® **B in standard design MDX60B ... -00**
  - Inverter for operation of asynchronous motors without encoder
  - **Space-saving version without option slots**
  - IPOS® plus in basic unit
  - Power ratings from 0.55 kW to 1.5 kW at 3x380 - 500 V in size 0 only

- MOVIDRIVE® **B in application version MDX60B ... -0T**
  - Same as MDX60B ... -00 in standard version
  - Additional activation of software application modules and technology functions (internal synchronous operation, electronic cam, ...)

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MDX60B, size 0S

- 0.55 / 0.75 kW
- Version without option slots

52402AXX

MDX61B, size 0S

- 0.55 / 0.75 kW
- Version with two option slots

52403AXX

MDX60B, size 0M

- 1.1 / 1.5 kW
- Version without option slots

52404AXX

MDX61B, size 0M

- 1.1 / 1.5 kW
- Version with two option slots

52405AXX

MDX61B size 1

- 1.5 / 2.2 / 3.0 / 4.0 kW
- Version with three option slots

52410AXX

MDX61B size 2S

- 5.5 / 7.5 kW
- Version with three option slots

52411AXX

MDX61B size 2

- 11 kW
- Version with three option slots

52412AXX

MDX61B size 3

- 15 / 22 / 30 kW
- Version with three option slots

52413AXX

MDX61B size 4

- 37 / 45 kW
- Version with three option slots

52414AXX

MDX61B size 5

- 55 / 75 kW
- Version with three option slots

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MDX61B size 6

- 90 / 110 / 132 kW
- Version with three option slots

2.3 MOVIDRIVE® MDX60B dimension drawings

Size 0S

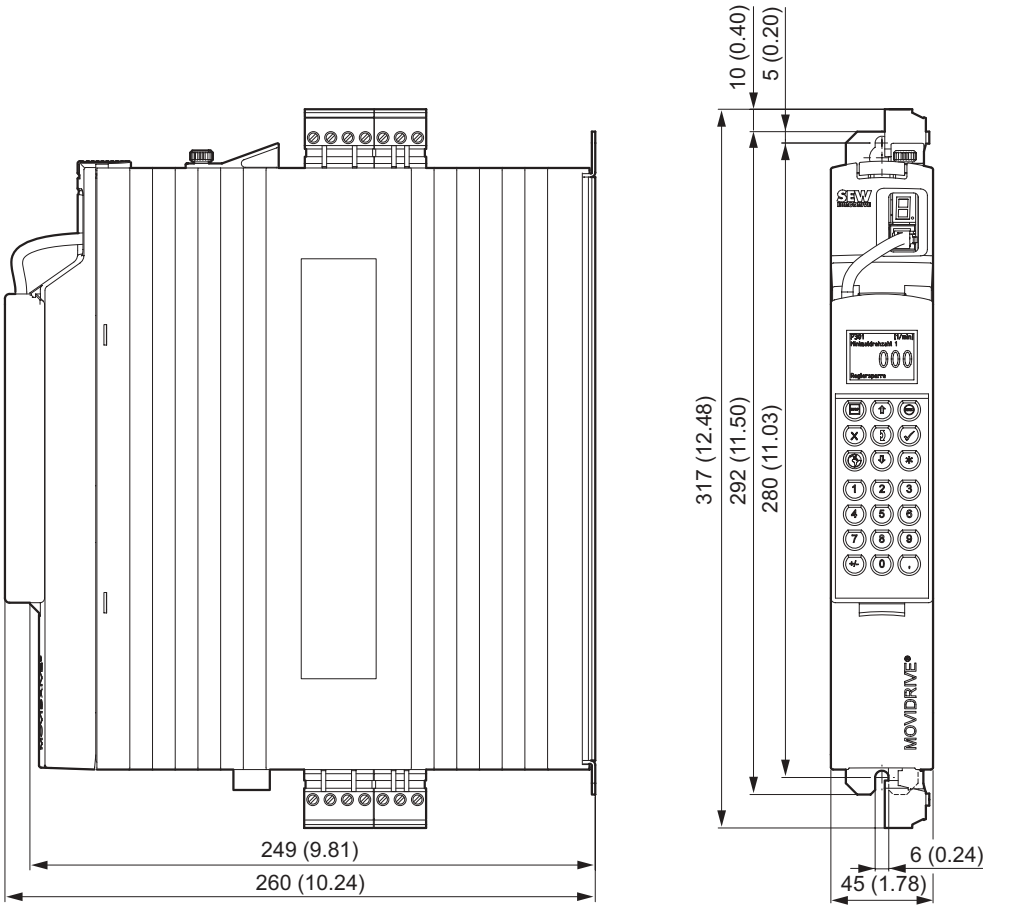

Figure 2: Dimension drawing MDX60B, size 0S, dimensions in mm (in)

Size 0M

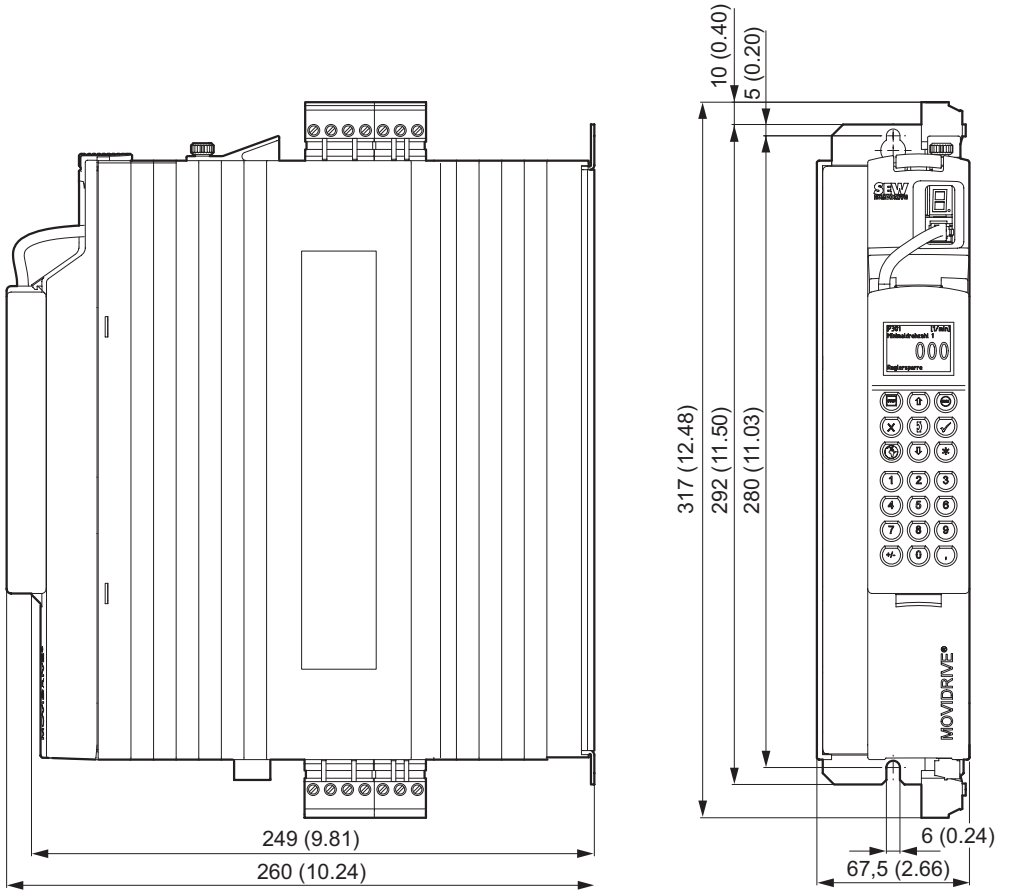

Figure 3: Dimension drawing MDX60B, size 0M, dimensions in mm (in)

2.4 MOVIDRIVE® MDX61B dimension drawings

Size 0S

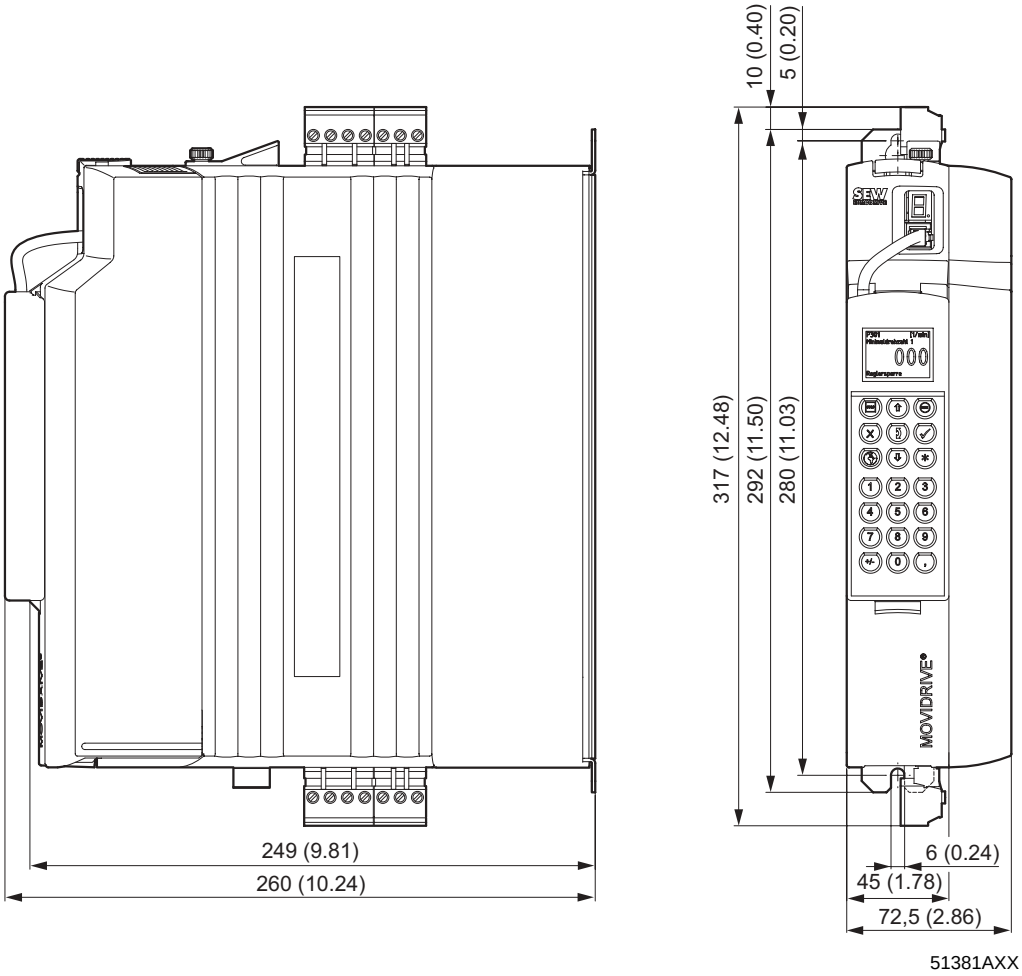

Figure 4: Dimension drawing MDX61B, size 0S, dimensions in mm (in)

Size 0M

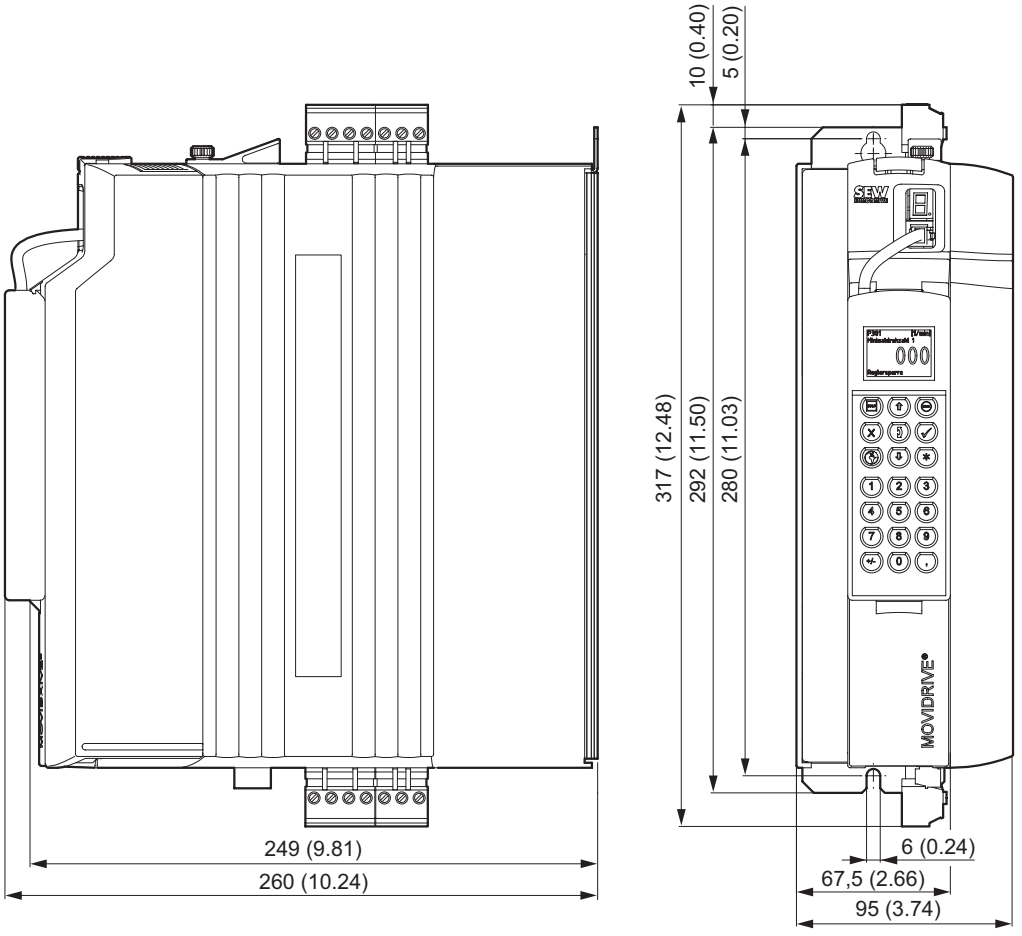

Figure 5: Dimension drawing MDX61B, size 0M, dimensions in mm (in)

Size 1

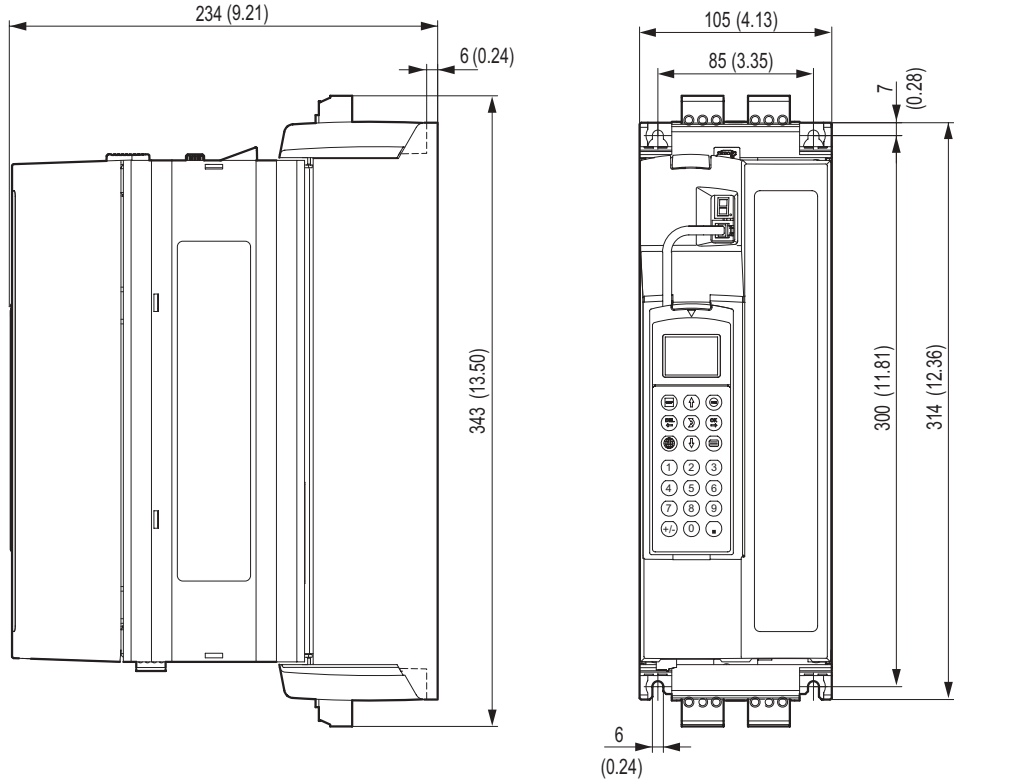

Figure 6: Dimension drawing MDX61B, size 1, dimensions in mm (in)

Size 2S

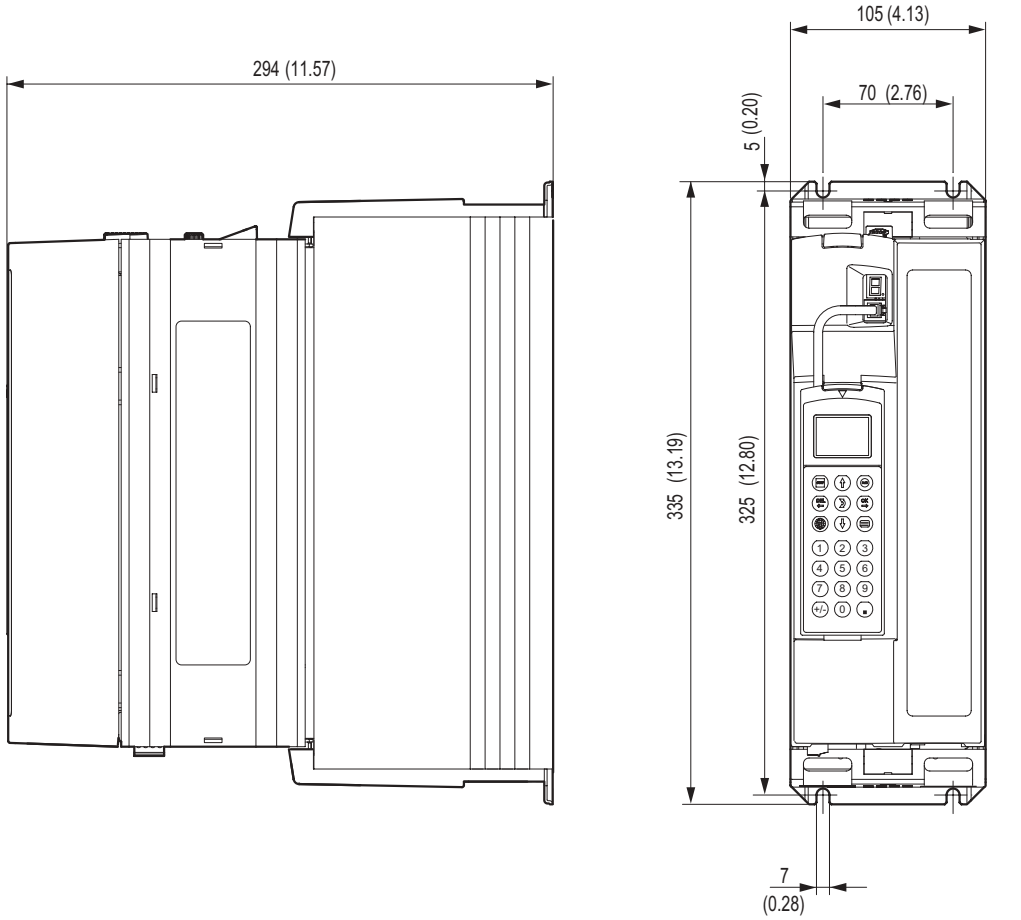

Figure 7: Dimension drawing MDX61B, size 2S, dimensions in mm (in)

Size 2

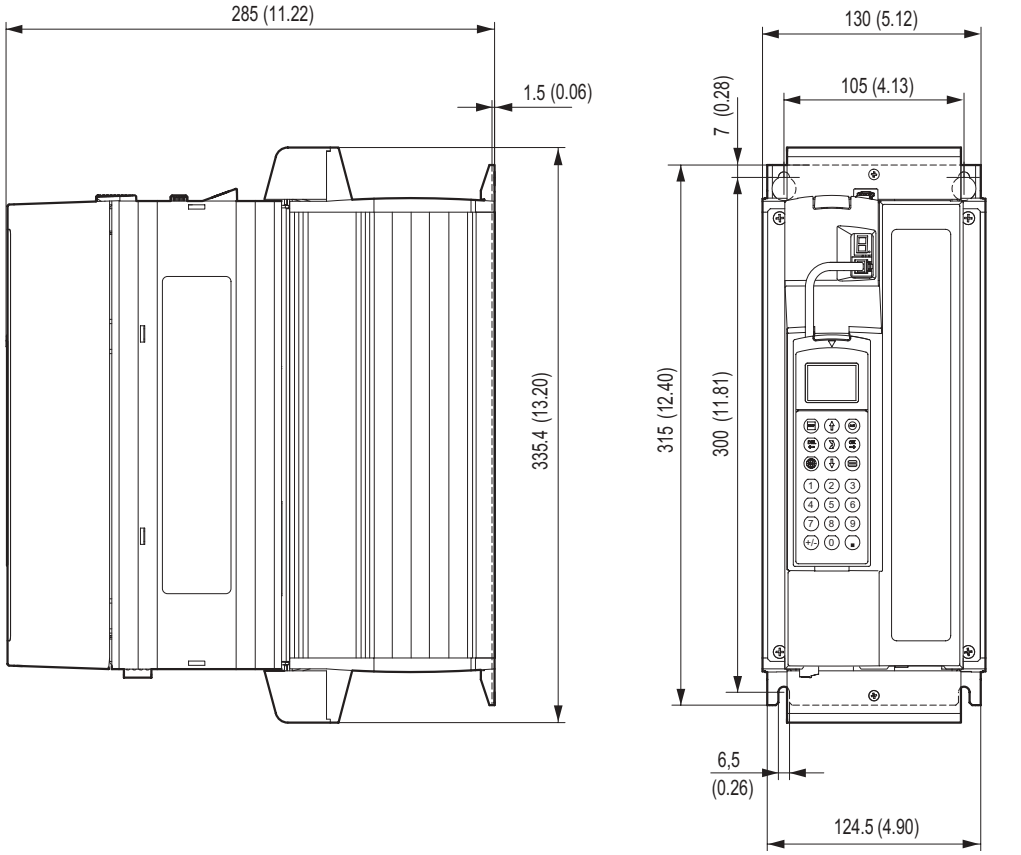

Figure 8: Dimension drawing MDX61B, size 2, dimensions in mm (in)

Size 3

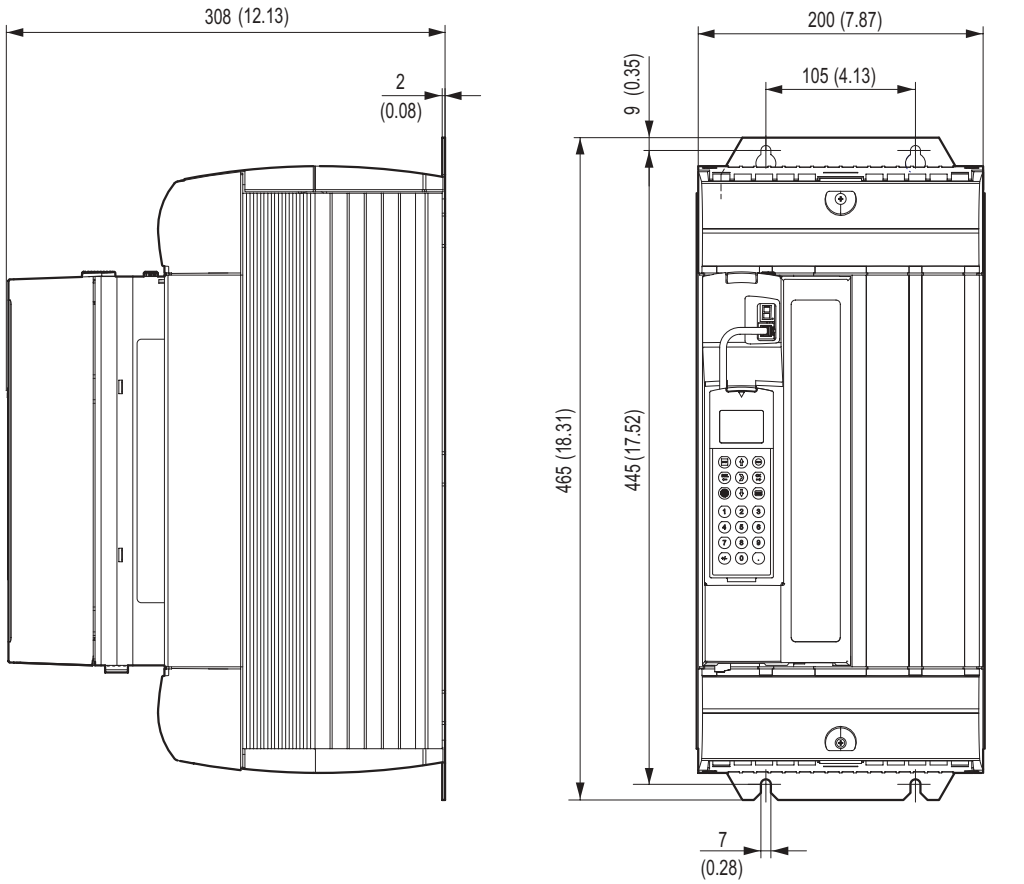

Figure 9: Dimension drawing MDX61B, size 3, dimensions in mm (in)

Size 4

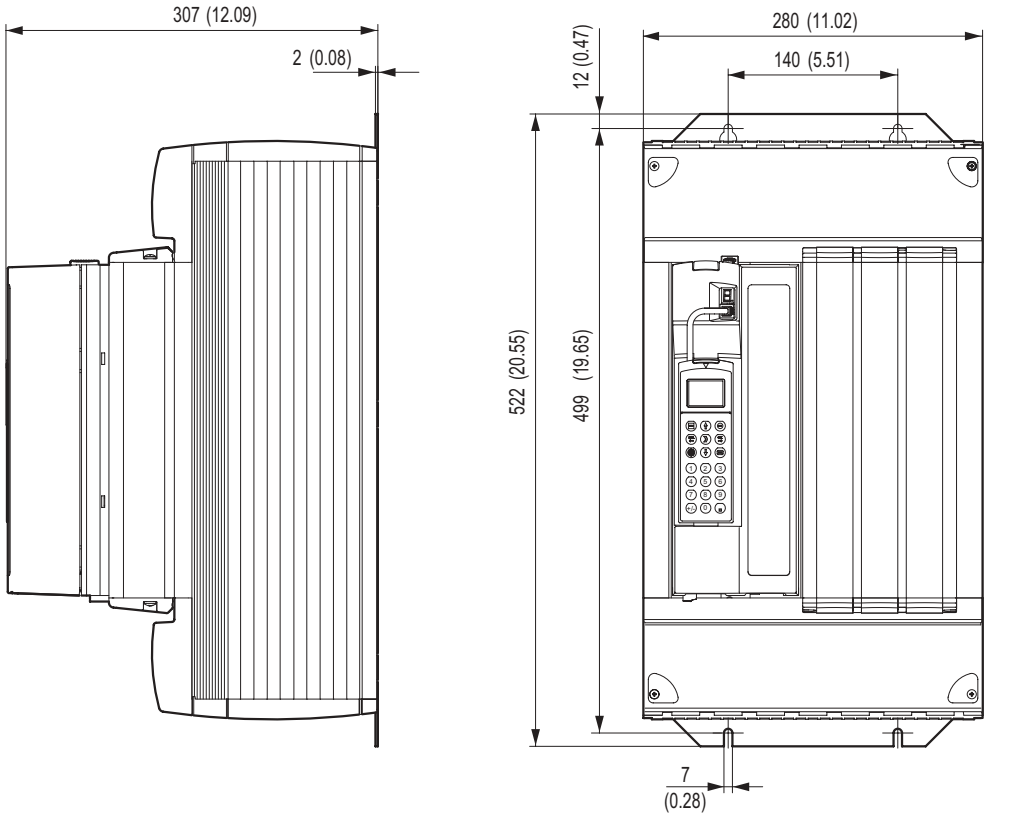

Figure 10: Dimension drawing MDX61B, size 4, dimensions in mm (in)

Size 5

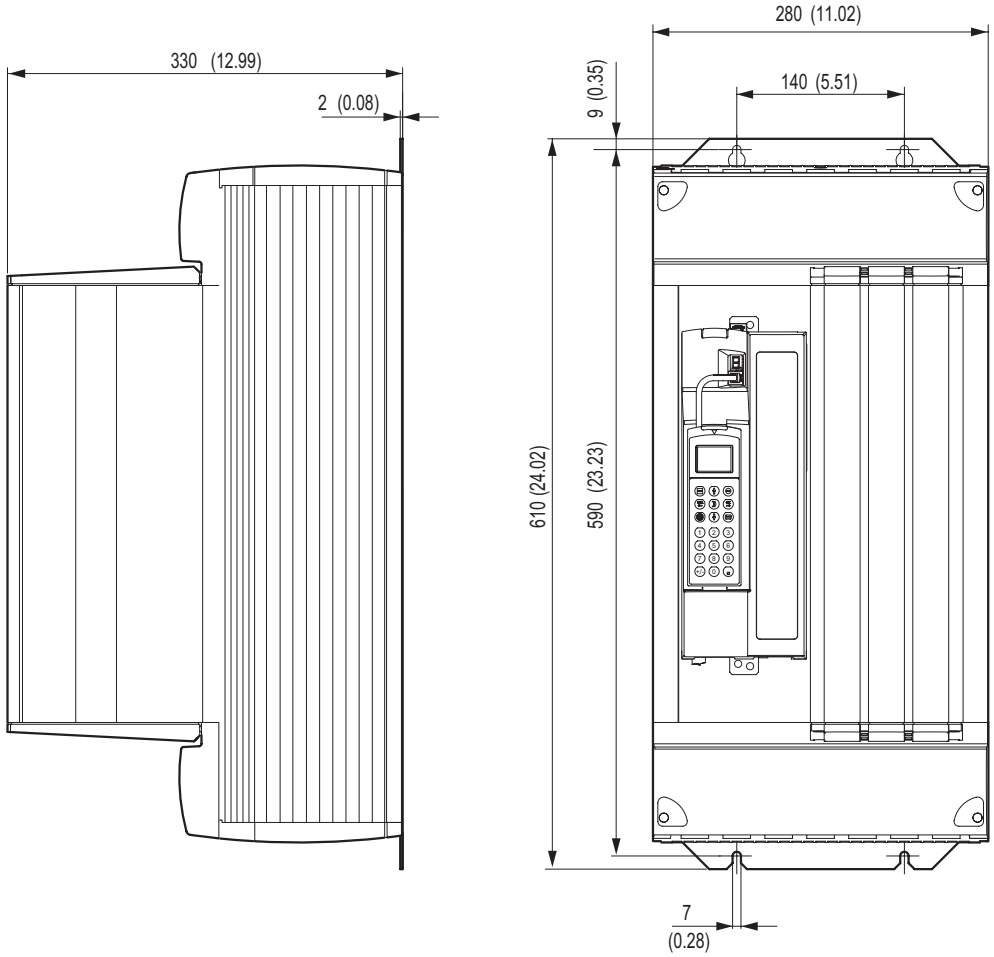

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Figure 11: Dimension drawing MDX61B, size 5, dimensions in mm (in)

Size 6

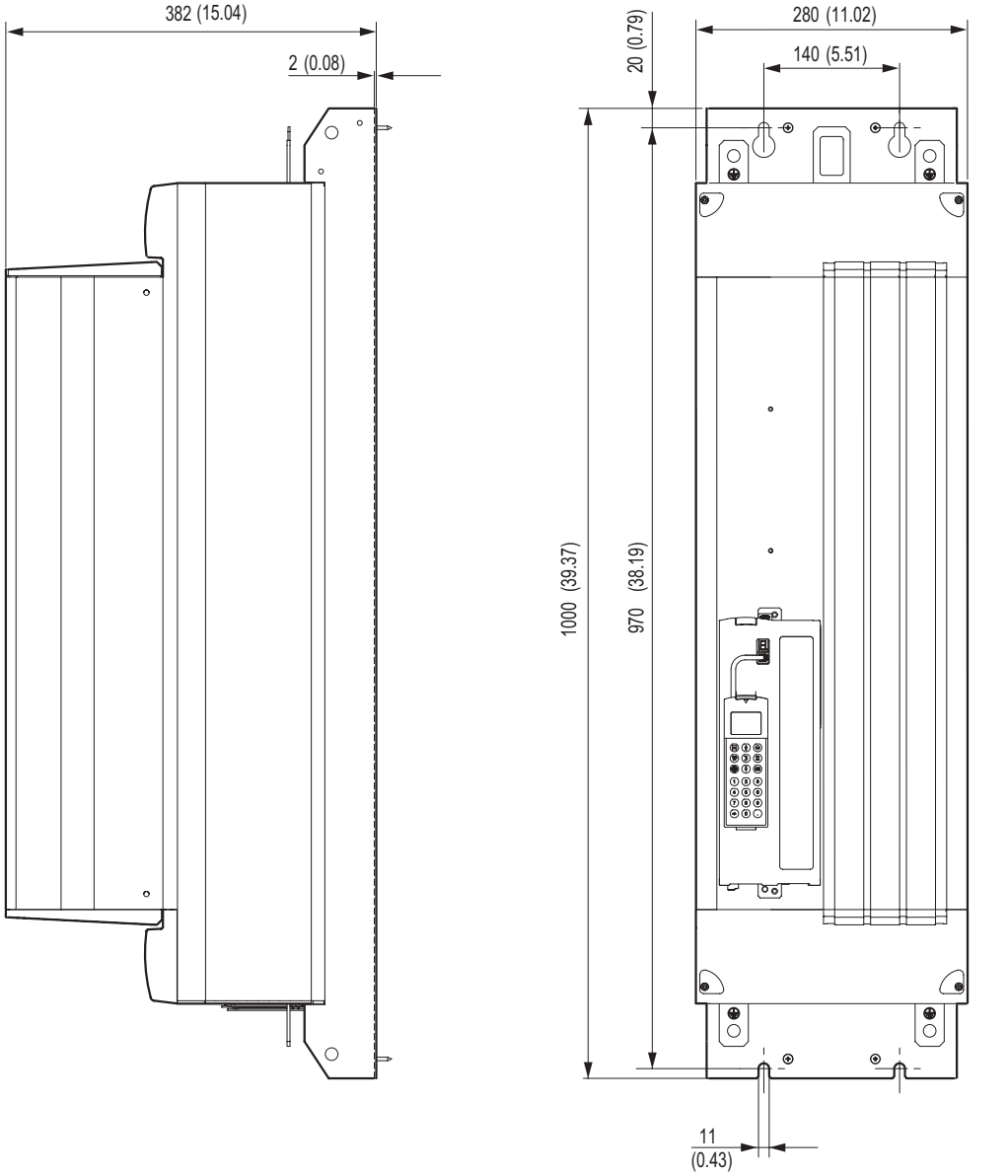
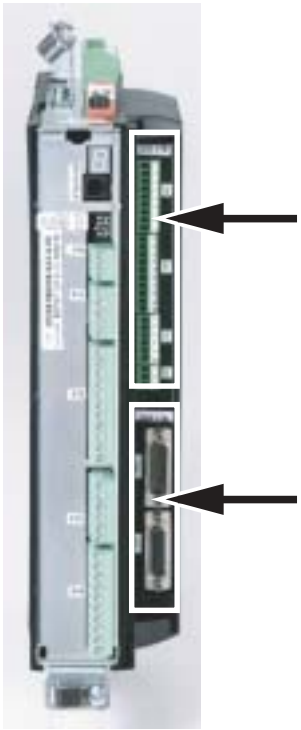


Figure 12: Dimension drawing MDX61B, size 6, dimensions in mm (in)

2.5 Option cards

MDX61B comes equipped with two option slots in size 0 and three option slots in sizes 1-6 for the installation of option cards.

MDX61B size 0



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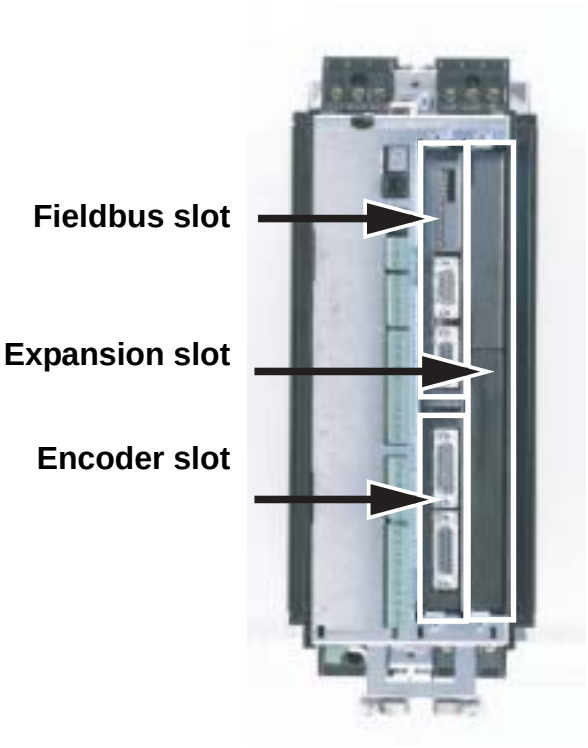
MDX61B sizes 1 - 6



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- **DEH11B: Encoder input incremental encoder / Hiperface**

  Option card for connection of a motor encoder (TTL, Sin/Cos or Hiperface) and a synchronous encoder (TTL or Hiperface). As an alternative to the synchronous encoder, there can be an encoder simulation (just like in MOVIDRIVE® A). This card is necessary when the previous unit was an MDV, MCV or MCH version. HTL encoders are no longer supported.

  Important: The encoder cables for synchronous encoders have to be replaced because of the 15-pin plug design. You can also use an adapter from 9-pin to 15-pin.

- **DER11B: Encoder input resolver / Hiperface**

  Option card for the connection of a resolver (synchronous servomotors) and a synchronous encoder (TTL or Hiperface). As an alternative to the synchronous encoder, there can be an encoder simulation (just like in MOVIDRIVE® A). This card is necessary when the previous unit was an MDS or MCS version.

  Important: The encoder cables for synchronous encoders have to be replaced because of the 15-pin plug design. You can also use an adapter from 9-pin to 15-pin.

- **DFP21B: Fieldbus interface Profibus DPV1**

  Option card for the connection of Profibus DPV1.The card is compatible to DFP21A. This card is always necessary when DFP11A, DFP21A or MOVIDRIVE®*compact* with Profibus has been used so far. The protocol expansion DPV1 offers additional functions such as lateral data communication and parameter channels that can be activated. Use of these additional functions is not mandatory. The option card is fully compatible to all previous installations.

- **DFI11B: Fieldbus interface Interbus**

  Option card for the connection of Interbus. The card is compatible to DFI11A. This card is necessary when DFI11A has been used so far. The DFI11B can process six process data (6 PD), which makes it suitable for the application module "Extended positioning via bus."

- **DFI21B: Fieldbus interface Interbus LWL**

  Option card for the connection of Interbus fiber optic cable. The card is compatible to DFI21A. This card is necessary when DFI21A or MCH42A have been used so far.

- **DFD11B: Fieldbus interface DeviceNet**

  Option card for the connection of DeviceNet. The card is compatible to DFD11A. This card is necessary when DFD11A has been used so far.

- **DFC11B: Fieldbus interface CAN/CANopen**

  Option card for the connection of CAN or CANopen (protocol DS301). The card is compatible to DFC11A or DFO11A. The option card results in an electrical separation. If there is no need for this electrical separation (operation of units in the same control cabinet), CAN or CANopen can be connected directly to the basic unit. This card is necessary when DFC11A or DFO11A have been used so far.

- **DIO11B: I/O expansion**

  Option card for the connection of additional 8I/8O binary and 1I/2O analog. The card is compatible to DFO11A. The size of the terminals has been reduced to 3.81 mm. This card is necessary when DFO11A has been used so far.

  Important: For units of size 0 from 0.55 kW to 1.5 kW, you cannot use a fieldbus interface and the I/O expansion at the same time.

- **DRS11B: Phase-synchronous operation**

  Option card for phase-synchronous operation control. The card is compatible to DRS11A. This card is necessary when DRS11A has been used so far.

  Important: The card can only be used in units as of 1.5 kW size 1.

- **DIP11B: Absolute encoder input SSI**

  Option card for the connection of an absolute encoder with SSI protocol. The card is compatible to DIP11A. All encoders approved for DIP11A can be used with DIP11B. This card is necessary when DIP11A has been used so far.

  Important: The card can only be used in units as of 1.5 kW size 1.

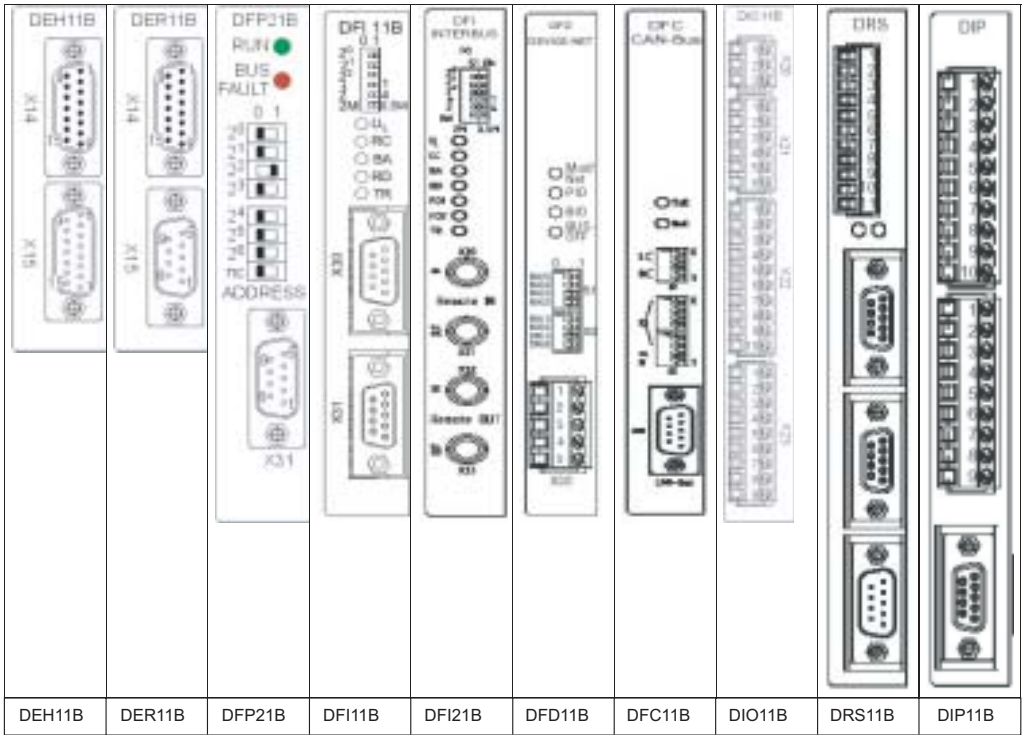

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Figure 13: Overview of option cards

Combination of option cards

The option cards are different in size and can only be installed in the matching option slots. The following list shows the possible combinations of option cards.

Type	Designation	Encoder slot Sizes 0 - 6	Fieldbus slot Sizes 0 - 6	Expansion slot Sizes 1 - 6
DEH11B	Encoder input incr. / Hiperface	X		
DER11B	Encoder input resolver / Hiperface	X		
DFP21B	Fieldbus interface Profibus		X	
DFI11B	Fieldbus interface Interbus		X	
DFI21B	Fieldbus interface Interbus LWL		X	
DFD11B	Fieldbus interface DeviceNet		X	
DFC11B	Fieldbus interface CAN/CANopen		X	
DIO11B	I/O expansion		X	X
DRS11B	Phase-synchronous operation			X
DIP11B	Encoder interface SSI			X

2.6 Accessories

Operation

- **UWS21A: Interface adapter**

  The connection of a PC for operation of MOVIDRIVE® B takes place via RS485 with a Western plug (RJ11). This interface is in operation in MC07, the fieldbus gateways and the fieldbus interfaces of MOVIMOT®. The transfer rate for MOVIDRIVE® B was increased to 56.7 kBaud.

- **UWS11A: Interface adapter**

  The PC connection to several MOVIDRIVE® B units at the same time (operating bus) takes place via the RS485 interface on the basic unit (screw terminals). The interfaces of all MOVIDRIVE® B will be connected to each other and linked with the PC via the central interface adapter UWS11A. The interface adapter is already in operation with the MOVIDRIVE® A.

- **DBG60B: Keypad**

  A keypad is available for operation of the inverter. It has at least the functions of the MOVIDRIVE® A keypad DBG11B. Several languages have been added as well as a comprehensive and firmware-independent parameter memory function. The keypad is attached on the MOVIDRIVE® B.

- **DOPxxA: Keypads**

  For operation of the MOVIDRIVE® B, keypads in enclosure IP65 are provided for easy installation on control cabinet doors. The keypads are available in different sizes, with monochromatic or color display, with keys or touchpads. A separate launch package will offer more information on this issue.

Overview

UWS21A

52450AXX

UWS11A

52451AXX

DBG60A

52452AXX

DOP11A-20

52453AXX

Line filters, line chokes, output filters and output chokes

The filters and chokes for MOVIDRIVE® A products will not be altered and are available for MOVIDRIVE® B sizes 0 to 6.

Braking resistors

The braking resistors of the current MOVIMOT® A products will not be altered and are available for MOVIDRIVE® B units. A new braking resistor is available for units in size 0 (0.55 to 1.5 kW).

- **BW90-052B: Braking resistor for size 0**

  The braking resistor BW090-P52B can be mounted directly to MOVIDRIVE® B in size 0 (0.55 kW to 1.5 kW). You do not need additional material for this installation. The next MOVIDRIVE® B can be installed without any distance between the two units even with the mounted braking resistor. The braking resistor has a continuous power of 100W, which makes it suitable for most horizontal applications.

52418AXX

Figure 14: Size 0 with installed braking resistor BW090-P52B

Line regeneration and DC link connection

The MDR60A line regenerators in 37 kW and 75 kW familiar from the MOVIDRIVE® A series have been completed with a 132 kW line regeneration. The project planning guidelines for the operation of MOVIDRIVE® units on line regenerators and the project planning guidelines for the connection of the DC links remain the same and are described in "MOVIDRIVE® drive inverters, DC link connection".

Plug adapter for replacement of MOVIDRIVE® A with MOVIDRIVE® B

Three adapters have been developed to quickly replace a MOVIDRIVE® A unit in running systems with a MOVIDRIVE® B unit.

- **DAT11B: Terminal adapter**

  Most signal plugs can be directly rearranged when operating MOVIDRIVE® A MDF, MDV or MDS. Only three plugs will have to be rewired. You can avoid such rewiring work by using the DAT11B terminal adapter. Use of this adapter will prevent incorrect connection and save time. The terminal adapter is necessary for terminals X11 (analog I/O), X12 (CAN) and X13 (inputs).

- **DAE15B: Encoder adapter X15**

  If a motor with encoder on X15 is in operation on an MDV or MCV, the encoder is connected via a 9-pin plug to the MOVIDRIVE® A. Since the DEH11B encoder card for MOVIDRIVE® B comes equipped with a 15-pin plug, you will either have to rework the encoder cable or use the encoder adapter. The encoder adapter can be plugged directly between the existing encoder cable with 9-pin plug and the 15-pin plug on the DEH11B. This step makes for fail-safe and fast connection of existing drives.

- **DAE14B: Encoder adapter X14**

  If a synchronous encoder or an encoder simulation at X14 is in operation on an MDV, MDS, MCV or MCS, the connection will take place via a 9-pin plug. Since the DEH11B encoder card for MOVIDRIVE® B comes equipped with a 15-pin plug, you will either have to rework the encoder cable or use the encoder adapter. The encoder adapter can be plugged directly between the existing encoder cable with 9-pin plug and the 15-pin plug on the DEH11B. This step makes for fail-safe and fast connection of existing drives.

All encoder cables of the MCH and the resolver cable of the MDS and MCS can be rearranged without adapter.

2.7 Unit designations and part numbers

Sample unit designation

MDX60 B 0030 - 5 A 3 - 4 00

Design	00 = Standard 0T = Application
Quadrants	4 = 4Q (with brake chopper)
Connection type	3 = 3-phase
Line filter	A = installed 0 = not installed
Supply voltage	5 = 380 ... AC 500 V
Recom-mended motor power	0030 = 3.0 kW
Version B	
Series	60 = no options can be installed 61 = options can be installed

The following units are available:

MOVIDRIVE® MDX60B/61B for 3 × AC 380...500 V supply voltage in standard design

Power [kW]	Size	Number of option slots	Type	Part number
0.55	0S	0	MDX60B0005-5A3-4-00	827 722 2
0.75	0S	0	MDX60B0008-5A3-4-00	827 723 0
1.1	0M	0	MDX60B0011-5A3-4-00	827 724 9
1.5	0M	0	MDX60B0014-5A3-4-00	827 725 7
0.55	0S	2	MDX61B0005-5A3-4-00	827 730 3
0.75	0S	2	MDX61B0008-5A3-4-00	827 731 1
1.1	0M	2	MDX61B0011-5A3-4-00	827 732 X
1.5	0M	2	MDX61B0014-5A3-4-00	827 733 8
1.5	I	3	MDX61B0015-5A3-4-00	827 957 8
2.2	I	3	MDX61B0022-5A3-4-00	827 958 6
3	I	3	MDX61B0030-5A3-4-00	827 959 4
4	I	3	MDX61B0040-5A3-4-00	827 960 8
5.5	IIS	3	MDX61B0055-5A3-4-00	827 961 6
7.5	IIS	3	MDX61B0075-5A3-4-00	827 962 4
11	II	3	MDX61B0110-5A3-4-00	827 963 2
15	III	3	MDX61B0150-503-4-00	827 964 0
22	III	3	MDX61B0220-503-4-00	827 965 9
30	III	3	MDX61B0300-503-4-00	827 966 7
37	IV	3	MDX61B0370-503-4-00	827 967 5
45	IV	3	MDX61B0450-503-4-00	827 968 3
55	V	3	MDX61B0550-503-4-00	827 969 1
75	V	3	MDX61B0750-503-4-00	827 970 5
90	VI	3	MDX61B0900-503-4-00	827 971 3
110	VI	3	MDX61B1100-503-4-00	827 972 1
132	VI	3	MDX61B1320-503-4-00	827 974 8

MOVIDRIVE® MDX60B/61B for 3 × AC 380...500 V supply voltage in application version

Power [kW]	Size	Number of option slots	Type	Part number
0.55	0S	0	MDX60B0005-5A3-4-0T	827 726 5
0.75	0S	0	MDX60B0008-5A3-4-0T	827 727 3
1.1	0M	0	MDX60B0011-5A3-4-0T	827 728 1
1.5	0M	0	MDX60B0014-5A3-4-0T	827 729 X
0.55	0S	2	MDX61B0005-5A3-4-0T	827 734 6
0.75	0S	2	MDX61B0008-5A3-4-0T	827 735 4
1.1	0M	2	MDX61B0011-5A3-4-0T	827 736 2
1.5	0M	2	MDX61B0014-5A3-4-0T	827 737 0
1.5	I	3	MDX61B0015-5A3-4-0T	827 975 6
2.2	I	3	MDX61B0022-5A3-4-0T	827 976 4
3	I	3	MDX61B0030-5A3-4-0T	827 977 2
4	I	3	MDX61B0040-5A3-4-0T	827 978 0
5.5	IIS	3	MDX61B0055-5A3-4-0T	827 979 9
7.5	IIS	3	MDX61B0075-5A3-4-0T	827 980 2
11	II	3	MDX61B0110-5A3-4-0T	827 981 0
15	III	3	MDX61B0150-503-4-0T	827 982 9
22	III	3	MDX61B0220-503-4-0T	827 983 7
30	III	3	MDX61B0300-503-4-0T	827 984 5
37	IV	3	MDX61B0370-503-4-0T	827 985 3
45	IV	3	MDX61B0450-503-4-0T	827 986 1
55	V	3	MDX61B0550-503-4-0T	827 988 8
75	V	3	MDX61B0750-503-4-0T	827 989 6
90	VI	3	MDX61B0900-503-4-0T	827 991 8
110	VI	3	MDX61B1100-503-4-0T	827 992 6
132	VI	3	MDX61B1320-503-4-0T	827 993 4

MOVIDRIVE® MDX61B for AC 230 V supply voltage in standard design

Power [kW]	Size	Number of option slots	Type	Part number
1.5	I	3	MDX61B0015-2A3-4-00	827 994 2
2.2	I	3	MDX61B0022-2A3-4-00	827 995 0
3.7	I	3	MDX61B0037-2A3-4-00	827 996 9
5.5	II	3	MDX61B0055-2A3-4-00	827 997 7
7.5	II	3	MDX61B0075-2A3-4-00	827 998 5
11	III	3	MDX61B0110-203-4-00	827 999 3
15	III	3	MDX61B0150-203-4-00	828 000 2
22	IV	3	MDX61B0220-203-4-00	828 001 0
30	IV	3	MDX61B0300-203-4-00	828 002 9

MOVIDRIVE® MDX61B for AC 230 V supply voltage in application version

Power [kW]	Size	Number of option slots	Type	Part number
1.5	I	3	MDX61B0015-2A3-4-0T	828 003 7
2.2	I	3	MDX61B0022-2A3-4-0T	828 004 5
3.7	I	3	MDX61B0037-2A3-4-0T	828 005 3
5.5	II	3	MDX61B0055-2A3-4-0T	828 006 1
7.5	II	3	MDX61B0075-2A3-4-0T	828 008 8
11	III	3	MDX61B0110-203-4-0T	828 009 6
15	III	3	MDX61B0150-203-4-0T	828 011 8
22	IV	3	MDX61B0220-203-4-0T	828 012 6
30	IV	3	MDX61B0300-203-4-0T	828 013 4

Accessories and options

Designation	Option slot	Type	Part number
Resolver / Hiperface	Encoder	DER11B	824 307 7
Hiperface / Hiperface	Encoder	DEH11B	824 310 7
Profibus DPV1	Fieldbus	DFP21B	824 240 2
Interbus copper cable	Fieldbus	DFI11B	824 309 3
Interbus LWL	Fieldbus	DFI21B	824 311 5
CAN / CANopen	Fieldbus	DFC11B	824 317 4
DeviceNet	Fieldbus	DFD11B	824 312 3
I/O expansion	Fieldbus	DIO11B	824 308 5
Phase-synchronous operation	Expansion	DRS11B	824 672 6
SSI encoder input	Expansion	DIP11B	824 313 1
Keypad		DBG60B	824 419 7
Interface adapter		UWS21A	823 077 3
Interface adapter		UWS11A	822 689 X
Braking resistor BG0		BW090-P52B	824 563 0
Terminal adapter		DAT11B	824 671 8
Encoder adapter X15		DAE15B	817 629 9
Encoder adapter X14		DAE14B	817 630 2

2.8 Unit functionality at time of sales release

MOVIDRIVE® B will come equipped with all functions and parameters of MOVIDRIVE® A at the time of the sales release. This option will make for a simple and complete change to MOVIDRIVE® B. In addition, the following new functions will be available:

- Increase of the IPOS$^{plus®}$ speeds to factor 10
- Additional IPOS$^{plus®}$ task 3
- Increase of the IPOS$^{®plus}$ program memory to factor 4
- Doubling the number of IPOS$^{plus®}$ variables from 512 to 1024
- Increase of the download speed to 57.6 kBaud
- Two additional binary inputs and three additional binary outputs in the standard unit
- I/O module can be connected to the system bus
- Pluggable memory module for quick unit replacement
- Safe protection against restart according to EN 954-1, category 3
- Jerk-limited acceleration for storage/retrieval systems
- Synchronized CAN operation for external setpoints (e.g. motion controller)
- Short-term overload of I_{max} = 200 % in size 0 to 1.5 kW
- Expansion of the speed range to ± 6000 min^{-1}
- Primary frequency as speed setpoint
- Internal synchronous operation (unit in application version) possible in VFC with synchronous encoder
- Expanded electronic cam functionality (unit in application version), 6 curves storage capacity
- Improved resolver evaluation, improved control response
- Simple positioning to initiators on motor fans
- Electronic nameplate for motors with Hiperface encoder
- Parameter "Starting mode"
- Control process "V/f characteristics"
- Running IPOS$^{plus®}$ program displayed in 7-segment display

Positioning and sequence control IPOS$^{plus®}$

The processing speed for IPOS$^{®plus}$ in MOVIDRIVE® B will be up to ten times that of MOVIDRIVE® A. The higher speed can be set separately for TASK 1 and TASK 2. This option makes it possible for MOVIDRIVE® B to process existing programs with the exact same time response. There is also a TASK 3 that runs very fast but whose time response depends on the processor workload. TASK 3 can be used for auxiliary programs.

The capacity of the program memory was increased fourfold and the number of variables to 1024.

MOVIDRIVE® **B: IPOS B = 10x IPOS A**

MOVIDRIVE® **B: Memory B = 4x memory A = 2x memory MCH**

MOVIDRIVE® **B: Variables B = 2x variables A**

Faster communication between PC and MOVIDRIVE®

The rate of the RS485 connection was increased to 57.6 kBaud to reduce the time required for downloads or data backups. The higher speed reduces the time required for data transfers by 25 - 35%.

MOVIDRIVE® **B: Download speed 57.6 kBaud**

Additional I/O terminals

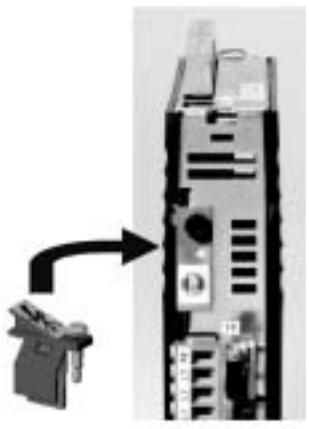
Two additional binary inputs and three additional binary outputs have been integrated into the basic MOVIDRIVE® B unit. This feature may even eliminate the need for an I/O expansion.

MOVIDRIVE® **B: I/O MOVIDRIVE® B = I/O MOVIDRIVE® A + 2I/3O**

Pluggable memory module for unit replacement

A pluggable memory module is available in the basic MOVIDRIVE® B unit. All unit data are stored in this module. The data are always current and do not have to be copied with typing errors.

This advantage is particularly apparent when replacing the unit. An electrician who is not even familiar with SEW products and technology can have the entire system up and running in no time without using a PC or making backup copies.



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1. Remove the defective unit
2. Install the new unit
3. Replace the memory card
4. Switch on the unit
5. Ready!

Secure protection against restart according to EN 954-1

EN 954-1 includes the description of safety functions in devices for the protection of operators. These safety functions are mainly focusing on mechanical danger. Other than with the emergency stop function, system operation does not usually involve the danger of electric shocks.

EN 954-1 is part of the machine guideline and binding for system manufacturers. In case of danger, the power supply was usually interrupted by contactors resulting in electrical separation and system standstill at the same time. This approach is not always necessary and may even be a disadvantage. In case an operator is in the danger zone during operation of the system, it is often better to interrupt the movement with a brake than turning off the power supply.

MOVIDRIVE® B has been approved as a protective circuit device in accordance with EN 954-1, category 3, stop category 1 by the TÜV (Technischer Überwachungsverein) and the BIA (Berufsgenossenschaftliches Institut für Arbeitsschutz). Each MOVIDRIVE® B includes documentation that describes the functionality and installation of the safety function. You will find a copy of the certificates in the documentation. Contrary to contactors, MOVIDRIVE® B can execute the safety function fast, wear-free and flexible.

The automotive industry and its suppliers demand these safety functions. That is the reason why every MOVIDRIVE® B basic unit comes equipped with the "Safe stop" function. You will find a description of the functionality and installation below.

MOVIDRIVE® **B: "Safe stop" according to EN 954-1, category 3**

Installation without "safe" inverter, redundant contactors

Installation example 1:

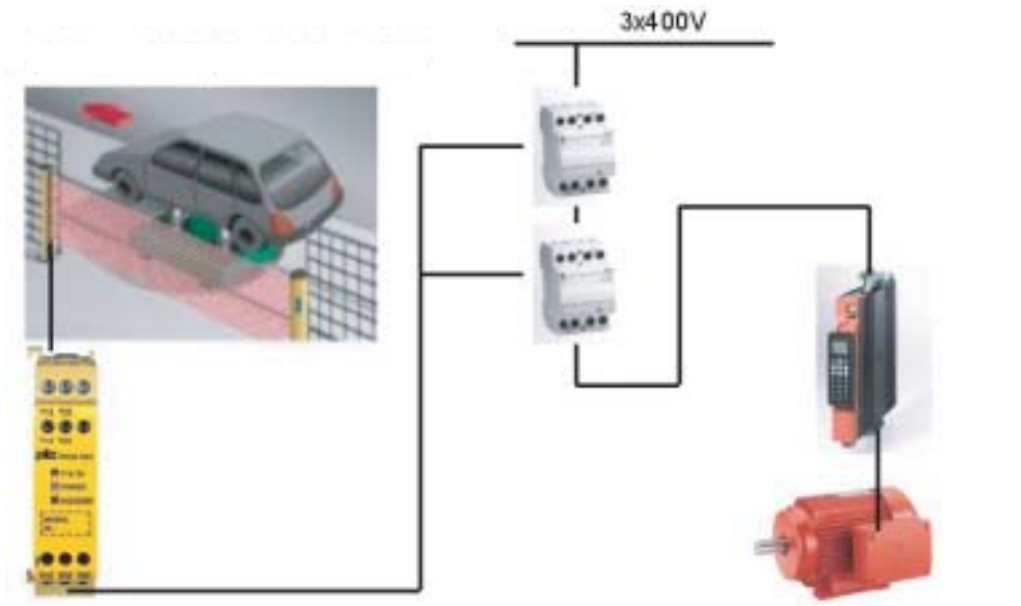

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Figure 15: Safe stop, with contacts

Installation with inverter and integrated "safe stop"

Installation example 2:

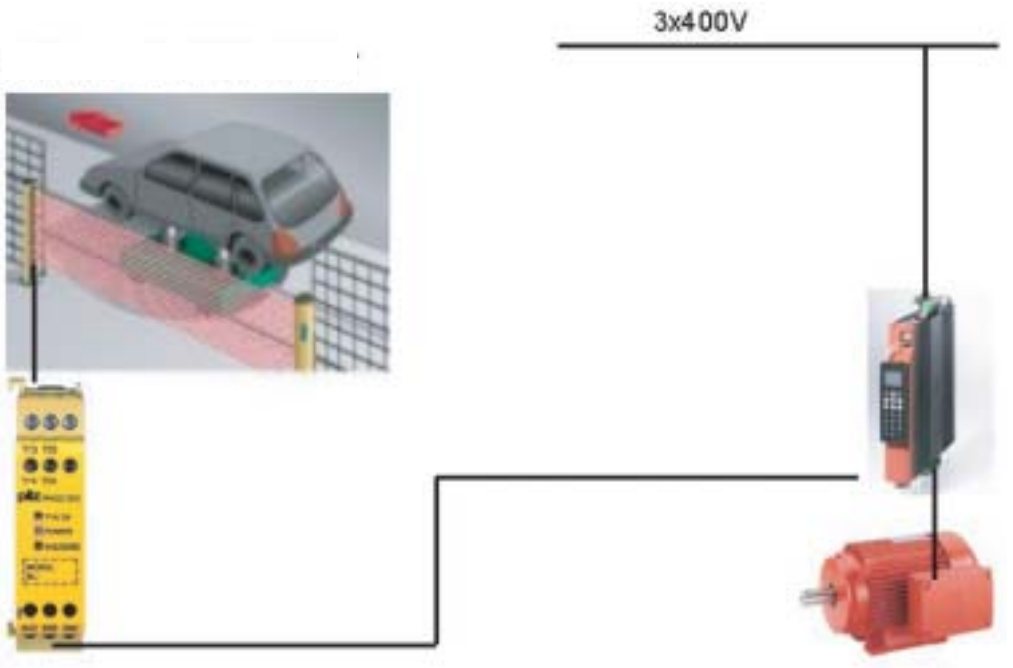

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Figure 16: Safe stop, inverter

Jerk-limited acceleration for storage/retrieval systems

An increase in acceleration is usually referred to as jerk. An excessive jerk can cause the systems to vibrate. Storage/retrieval systems are particularly vulnerable. To avoid vibrations in these units, there is a MOVIDRIVE® MDV60A special design that lets the operator limit the jerk by setting a special parameter. This special function has been integrated in the MOVIDRIVE® B standard unit.

MOVIDRIVE® **B: Jerk limitation for the protection of vibration-prone systems**

Synchronized system bus for connection to motion controller

External motion controllers are used to travel different paths over several axes. These motion controllers preset the actual setpoints for each inverter. MOVIDRIVE® B can be connected to the motion controllers via the system bus. This mode requires a special synchronized operation that is activated via a parameter (5 ms or 10 ms).

MOVIDRIVE® **B: Synchronized operation with motion controllers**

Short-term overload of 200 % in size 0 up to 1.5 kW

Dynamic drives are particularly used for small power ratings. That is the reason why we have implemented a short-term overload of I_{max} = 200 % I_n in the MOVIDRIVE® B units up to 1.5 kW in size 0. This makes for acceleration processes with higher torques than before.

MOVIDRIVE® **B: 200 % short-term overload up to 1.5 kW**

Expanded speed range up to ± 6000 min^{-1}

The speed limit was increased from 5500 min^{-1} to ± 6000 min^{-1} to operate the motors at high speeds. This increase makes it possible to operate CM synchronous servomotors up to maximum speed.

MOVIDRIVE® **B: n_{max} = 6000 min^{-1}**

Improved resolver evaluation, improved control response

The evaluation of the resolver has been improved. Drives can now be operated at greater stiffness and improved control response.

MOVIDRIVE® **B: improved control response with synchronous motors**

Simple positioning to initiators on motor fans

You can use the positioning to initiators on the motor fan (NV26) as it is used in the MC07 units for simple positioning with MOVIDRIVE® B. The functionality of this positioning process is very limited and requires an IPOS$^{plus®}$ program. There are no software application modules available. This type of positioning does not require an encoder card; the initiators are connected directly to the binary inputs.

MOVIDRIVE® **B: Simple positioning without encoder card**

Electronic nameplate for motors with Hiperface encoder

If a servomotor type CM (synchronous) or CT/CV (asynchronous) is used with a Hiperface encoder (AV1H, AS1H, ES1H), an electronic nameplate will be generated during production and stored in the memory module of the encoder. It contains the data of the motor nameplate plus additional information, such as "exact gear unit ratio" or additional electrical motor data. There is also a line for customers to enter text, such as part numbers or motor name. If the startup is started with MOVITOOLS®, MOVIDRIVE® B will read the data from the encoder and will start an automatic startup process. This option makes for fast and safe startup, particularly for systems in which the motor is not accessible.

MOVIDRIVE® **B: Automatic startup with electronic nameplate**

2.9 Unit functionality in preparation

Additional functionality will be added to the unit in a second phase following the release for series production of MOVIDRIVE® B. The following functions are in preparation and their availability will be announced in a sales information letter:

- Energy saving function for pumps and fans (fan characteristics)
- CANopen operation in the basic unit without option card, SBus can be used as SBus or CANopen
- CANopen operation metallically separated with option card
- Operation of synchronous linear motors
- PID controller as process controller
- Additional application modules
- and more

2.10 Compatibility with MOVIDRIVE® A

All applications available with MOVIDRIVE® A can be implemented with MOVIDRIVE® B without major adjustments.

- IPOS$^{plus®}$ programs from MOVIDRIVE® A can be operated without limitations in MOVIDRIVE® B. For an identical time response, do not increase the IPOS$^{plus®}$ processing speed.
- The application modules were tested with MOVIDRIVE® B and run without limitations.
- A MOVIDRIVE® A parameter set as of MOVITOOLS® 4.0 can be copied to MOVIDRIVE® B. A prerequisite is that MOVIDRIVE® A and MOVIDRIVE® B have the same power rating at the same size.
- SEW-EURODRIVE offers a CD with macros for all SEW electronic products to generate wiring diagrams with EPLAN. This CD will be expanded to include MOVIDRIVE® B.

Comparison MOVIDRIVE® A and MOVIDRIVE® B

The following two tables are a comparison of MOVIDRIVE® A and MOVIDRIVE® B. It will make it easier to determine the MOVIDRIVE® B components necessary to replace the existing MOVIDRIVE® A.

Basic units

MOVIDRIVE® A	MOVIDRIVE® B		
Basic unit	**Basic unit**	**Encoder option**	**Fieldbus option**
MDF60A	MDX60B or MDX61B	-	-
MDV60A	MDX61B	DEH11B	-
MDS60A	MDX61B	DER11B	-
MCF40A	MDX60B or MDX61B	-	-
MCF41A	MDX61B	-	DFP21B
MCV40A	MDX61B	DEH11B	-
MCV41A	MDX61B	DEH11B	DFP21B
MCS40A	MDX61B	DER11B	-
MCS41A	MDX61B	DER11B	DFP21B
MCH40A	MDX61B	DEH11B	-
MCH41A	MDX61B	DEH11B	DFP21B
MCH42A	MDX61B	DEH11B	DFI21B

Options

MOVIDRIVE® A	MOVIDRIVE® B	Comment
DFP11A	DFP21B	Fully compatible, terminating resistor for Profibus cannot be connected to DFP21B.
DFP21A	DFP21B	Fully compatible
DFI11A	DFI11B	Fully compatible
DFI21A	DFI21B	Fully compatible
DFC11A	DFC11B	Fully compatible
DFO11A	Basic unit / DFC11B	CANopen without electrical isolation already integrated in basic unit. Electrical isolation requires DFC11B.
DIP11A	DIP11B	Fully compatible, but can only be used as of 1.5 kW size 1.
DRS11A	DRS11B	Fully compatible, but can only be used as of 1.5 kW size 1.
USS21A	UWS21B	Fully compatible, can also be used for MC07.

Special characteristics for operation of MOVIDRIVE® B

- The option cards SSI input (DIP11B) and synchronous operation (DRS11B) fit only in the expansion slot as of size 1 (starting at 1.5 kW). You cannot use the two cards at the same time. The cards cannot be used in size 0. Synchronous operation in size 0 can be implemented through internal s ynchronous operation.
- The I/O expansion (DIO11B) must have a 24 V supply. This 24 V supply can be taken off the MOVIDRIVE® at small loads. The size of the terminals has been reduced from 5.08 mm to 3.81 mm.
- An existing system with MOVIDRIVE® MDF, MDV, MDS + DIO11A + (fieldbus card or second DIO11A) cannot be replaced by a MOVIDRIVE® B in size 0 (0.55 kW to 1.5 kW). Fieldbus and DIO11B occupy the same slot in size 0. A compatible solution is available as of size 1 (as of 1.5 kW).
- An existing system with MOVIDRIVE® *compact* in size 2 (5.5 kW or 7.5 kW or 11 kW) could be (barely) installed in a control cabinet with a depth of 300 mm. MOVIDRIVE® B has a greater installation depth and requires a 400 mm control cabinet.
- If a motor with Hiperface encoder was connected to an MCH, the encoder cable could be connected to a MOVIDRIVE® B without alterations. The plastic cover cannot be closed due to the straight cable duct. If that is a necessary requirement, the plug must be changed to a 45 ° outgoing cable with the same bend.
- A MOVIDRIVE® A parameter set can only be copied with MOVITOOLS® as of version 4.0. That option is not available with the DBG keypad.
- The mounting surface and the bore arrangement have changed with MOVIDRIVE® B in size 2S (5.5 kW and 7.5 kW). The unit requires less space than a MOVIDRIVE® A unit. All other power ratings have the same mounting surface and bore arrangement as MOVIDRIVE® A.
- You cannot connect HTL encoders to MOVIDRIVE® B units.
- Sin/cos encoders and TTL encoders are connected with sub-D-9 plugs in MOVIDRIVE® A. The connections for MOVIDRIVE® B are sub-D-15 plugs. Adapters are available for the quick replacement of a unit. New systems have to be equipped with cables with sub-D-15 plugs.
- The encoder simulation (X14) was a sub-D-9 plug in MOVIDRIVE® A. MOVIDRIVE® B uses a sub-D-15 plug. Adapters are available for the quick replacement of a unit. New systems have to be equipped with cables with sub-D-15 plugs.
- When replacing MOVIDRIVE® A with MOVIDRIVE® B, the I/O of terminals X10, X11 and X12 have to be rewired. A terminal adapter is available for fast and fail-safe replacement.

SEW-EURODRIVE GmbH & Co KG · P.O. Box 3023 · D-76642 Bruchsal/Germany
Phone +49 7251 75-0 · Fax +49 7251 75-1970
http://www.sew-eurodrive.com · sew@sew-eurodrive.com

SEW EURODRIVE